

# 2015 CHaMP Camp Workshop

## Geomorphic Unit Toolkit

June 4, 2015

9:15 a.m. – 10:30 a.m.

Lead Trainer: Joe Wheaton

**Objectives:** To provide background on how geomorphic units relate to habitat units and channel units and show how using GUT we can derive these consistently and objectively from topography.

**Software needs:** ArcGIS 10.1 and CHaMP Topo Toolbar w/ GUT

**Additional Resources:** Accepted. Wheaton JM, Fryirs K, Brierley G, Bangen S, Bouwes N, and O'Brien G. Geomorphic Mapping and Taxonomy of Fluvial Landforms. Will appear in Geomorphology.

### Abstract:

Geomorphic Units are the building blocks of reaches. Geomorphic units (e.g. pools, bars, planebed etc.) make up the majority of a reach, and together with structural elements (e.g. LWD and boulders) as well as fluvial margins comprise both the in-channel and out-of-channel riverine environment. The assemblage of geomorphic units collectively define much of the physical habitat of a reach for fish. We assert that more consistent identification of geomorphic units will not only help in explaining why certain reaches look the way they do and what processes are shaping them, but more fundamentally should result in stronger fish-habitat relationships. We present a newly developed taxonomy for defining geomorphic units that is rooted in a simple tiered classification that emphasizes clearer topographic definitions to arrive at specific geomorphic units. While geomorphologists have used nearly 100 different names for different geomorphic units, only 60 of these are unique, and using the proposed taxonomy can help filter down to a short-list of 1 to 3 possibilities in a matter of seconds from some very basic lines of evidence including vertical position (stage), shape (e.g. concave, convex, planar) and other defining attributes (e.g. orientation, position, relative roughness etc.). We show how we are leveraging these definitions in GUT to automatically derive geomorphic units from CHaMP topographic surveys. Moreover, we discuss how geomorphic unit assemblages are a prediction from network scale modelling efforts to identify reach type and condition (i.e. GNAT).

This workshop will walk participants through each of the above concepts and then illustrate their application at a site in the Lehmi Watershed.